

the most important uses of the World Wide Web (Web) is to search out information contained in one or more servers on the Web. The problem is that the information contained on those servers, while currently totaling over one billion pages is not necessarily the information a 5 searcher might desire or it is not in a format that the searcher can utilize. Hence, person to person communication has not been outmoded and will continue to be important in the coming years. This is especially true in large organizations of 30,000 and up where the proverbial left hand and right hand do not know what each 10 is doing and there are many costly examples of duplication of effort. This invention facilitates the matching of two or more persons in the public side of the Web and behind firewalls in large organizations for the purpose of the creation of two person and larger communities of interest about a specific topic, product, 15 process, place, person, team, financial instrument, organization, news item, job, project, technology and so forth.

This invention relates generally to computerized searching of large 20 electronic databases or telephonic systems, wired or wireless, for an automatic electronic community formation system that creates new communities with chat and other community functions. The invention finds matching search terms and invites the searchers to join. The present invention applies to telecommunication networks, the Internet, local area networks, wide area networks, intranets, 25 extranets, and standalone computers.

#### BACKGROUND OF THE INVENTION

The Internet presents the dual problems of an overabundance of data, sometimes called information overload, and a dearth of human 30 contact, judgement or wisdom. This lack of human contact has fostered the popularity of online chat, bulletin boards and online communities such as Motley Fool, the Yahoo Clubs, The Well, Nyx,

Metropolis, MUDs, PPP/SLIP, Usenet Newsgroups, IRC, Pics OnLine, PcBoard, GeoCities.com, and Tripod.com.

The lack of judgement or wisdom comes from the lack of time and  
5 attention given over to quiet contemplation and discussion before  
large-scale action is undertaken. Before decisions are made the  
wisdom of experience and analysis needs to be tapped. Which road to  
travel is often more important than the speed one attains -  
especially if the wrong turn is taken.

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Large corporations, non-profits and governmental organizations  
value the enhanced efficiencies that arise from collaboration and  
knowledge sharing. For instance, a multi-national manufacturing and  
service companies with hundreds of branches in a multitude of  
15 countries often finds that they have a failure of communication and  
various corporate leaders and teams are unaware of what other teams  
and individuals are working on. They would like a permission-based  
system that allows employees to find others who have similar  
interests. Likewise, government and quasi-governmental agencies  
20 like NIST, CDC, FDA, NAS, NRC, the Executive Branch in general can  
be so large that people engaged in similar work can remain unknown  
to each other, resulting in costly duplication of effort, time and  
resources.

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There is currently no tool that allows personnel to be matched  
based on their search strings. There are at least two companies who  
have products that search all the email and create a knowledge map  
of who is working on what topic with their permission. This  
invention is less intrusive.

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#### SUMMARY OF THE INVENTION

Electronic networks (e.g., the Internet) provide a number of

services for its users. The primary services relevant to this patent application are communities or stand alone chat rooms, bulletin boards, list serves, electronic mail (email) and databases.

5 One of the major driving forces in the growth of networks in general and the Internet in particular has been the way it facilitates people's ability to find others of similar interests. Chat, bulletin boards, date matching services and list services are among the most popular activities on the net. People have a need to  
10 meet people and overcome the limitations of their physical separation.

15 However, one of the weaknesses of these existing systems is that they require users to either (1) enter a pre-defined gathering space or answer questions or (2) create a pre-determined profile. Such previous systems would by their nature limit the matches to the predetermined records and fields or a profile. If the participants or designers of existing matching systems fail to anticipate a new topic, interest or future need matching cannot occur.

20 This patent covers the apparatus, means and methods for automatically matching based upon the search terms entered into a telecommunications system, the Internet (World Wide Web), standalone computer, intranet or extranet. Further, it provides a means and  
25 method of comparing that search with prior search terms entered by others to make a match between similar searches - without needing to predetermine the basis for the match. After making a match the invention will invite the matched parties to join a frictionless and immediate electronic community if they so desire. These communities  
30 may be as small as just two people and as large as tens or hundreds of thousands of participants.

Who is benefited from this invention? People who are having trouble utilizing their new product purchase and would like to talk, chat, or email with someone who has bought the product earlier and figured out how to use it. Someone researching a rare disease and 5 seeking a medical expert might use this invention with life saving results.

What else exists today that provides a portion of the functionality of the intention? ICQ, AOL and other Chat rooms, List 10 servers, and UseNet groups are set up around a particular topic and these list servers are collected and administered or archived by Yahoo, ICQ, AOL, Topica and Google to name a few. The problem is that there typically needs to be a critical mass of 5-500 users to provide enough people to cover the wide range of questions that 15 might be ask on any given topic. This invention only requires that there be as little as two people who have a similar interest and even if the earlier searcher is not currently looking for information on this subject this invention "remembers" his or her interest and offers to make a match.

Who kind of searches work best with the invention? The more specific the search the more targeted are the results. For instance someone searching for "jaguar" might get matched to people interested in cars, a cat, a Florida football team, a type of 25 computer. So users who search for and XKE Jaguar acceleration will only get information about that car and not the jungle animal.

List servers are one of the components of this system. Email can be subdivided into one-to-one delivery and one-to-many. One-to-30 many is supported by list servers that maintain distribution lists. The distribution lists can be edited electronically by sending email directly to programs that maintain the lists. An example of the

one-to-many email services is Usenet. Herein, we define the "many" in one-to-many as a community. Questions can be posed to community members so those users can solve problems. An object of a community is to provide users a way to ask for or share information with other users. Users who use a list serve or chat room often times cannot find communities to pose questions. Existing communities might be off-topic or too broad, or might not exist for a particular topic of interest.

The web is a database distributed across many computers. The various computers are connected electronically via hyperlinks in the data itself. A derivative service of the web is a means, described or referred to as "a search engine," that enables users to locate information in the distributed database. An object of search engines is to help users find information on the Web. Users often times have difficulty obtaining information because the search engines find too much or too little information. Users also have trouble finding other people of similar interests.

The object of this invention is for users to combine the services of search, email, phones, fax, and the web to form communities. The present invention is designed to operate in person using a standalone computer, or a computer that provides communication to users with an archival database, interface to a phone handset on a telecommunications or data network, a wireless phone, automated agents and an electronic list server.

Users can communicate with the computer via direct network connections, serial lines (e.g., a modem connection), or directly via a keyboard/monitor combination. Users may be identified using various means including their email address, their login name, or other unique identifier; denoted their ID, or some combination of

these. Other means of identifying users are possible and the present invention is not limited to those listed here

The initial interaction of the user with the computer is to  
5 search for data. In the present embodiment of the invention, the data could be located on the computer itself, in distributed databases over a network connection (e.g., the Internet, intranet or extranet) or over a telephone system. The user performs a search utilizing natural language consisting of a series of keywords,  
10 phrases, or sentences, called a "search string." Other types of search strings or search input are possible. The computer has means to pass the search string or search input to a search engine, which could be located on the computer itself or remotely on the network.

15 The invention will take people matched by their search string or search input and offer them the opportunity to enter an existing community or create a new community consisting of a text or voice chat room for real-time conversation via text or speech and a bulletin board. The community can also contain useful links to  
20 information, goods and services. Also the community will provide users with preferences to modify the look, feel and functionality of the community. For example users may not want a chat room and only want a bulletin board. Users may or may not want to shop from a community. Users may or may not want the community to suggest links  
25 to information, goods and services.

The computer also contains a storage mechanism (e.g., a disk) on which a database is maintained. In the present embodiment of the invention, there is database. This database provides a method of  
30 keeping track of search entries and who made those searches. The database maintains a set of entries containing a user ID, an associated search string, and a name or names of relevant

community(s).

A community is a gathering of two or more people, virtual people or intelligent agents. A community contains a text or voice 5 chat room and a bulletin board and useful links.

When the user enters a new search string and the search string is entered into the database, the community field is set to an empty string, denoted null. The invention will attempt to make match 10 between a current search by one person and previous searches by one or more other person(s). The invention will also attempt to locate (match) a current search string with existing communities on the Internet, a telecommunications system or elsewhere. These existing communities might have been set up previously by the invention or 15 exist elsewhere on a network. The invention stamps the time and date of the search. In a preferred embodiment of the invention, the database is routinely purged of entries older than a specified duration.

20 Matching telephone or Internet users based on any search terms with anyone else in the world subscribing or otherwise able to access this invention creates frictionless worldwide voice-based or data-based communities assembled in real-time with no bureaucracy.

25 Users are not required to enter profile information about themselves. Contextual information can be gathered from a larger universe of identifiers that indicate this person is a member of a consumer, chemical, electronics, job search, transportation, scientific, engineering, arts, social services, other industry 30 verticals, or indicators of other broad categories about the type or nature of the user. For example, this information can be derived from their passage through a hierarchical search, a password, name

of their originating site or the domain of the user.

A preferred embodiment of the invention should give users the ability to simply turn off the matching feature from their computer, 5 browser or telephone. Also the invention can provide for levels of permission and levels of security. Likewise, an embodiment of the invention allows the users to specify the age of search matches. For example, a user might ask that no search match older than 6 months occur and another user might insist that no match older than 10 3 weeks be made.

After the user has entered his/her search string, the computer checks all other entries in the stored database to see if the present search string matches a previous search string in the database. This database incorporates one or more of the following methods: words in a database (with triggers or without), a hash table (faster but more memory intensive), a flat text file, an associative array (built on top of a hash table), or rules in a forward-chaining production system (fast but memory intensive). 15 20 25 This same invention can be used on a telephone via sounds with associated meaning stored by a voice to text software program to the invention, such as Naturally Speaking or Via Voice. This enables the present invention for use on a data network and, or, telephone system to facilitate making matches over analog, digital or mixed phone and computer systems.

The mechanisms for implementing matching for a search string include the following methods: simple string match - does a word or series of words in the query match an item in the stored database 30 within the system; a weighted string match - for each word in the query assign points to items in the system based on an inverse overall frequency score so that 'rare' words get higher scores than

common words and return the items with the highest overall scores.

On these match methods the invention incorporates a number of methods as follows: closeness, increase the score where words matching in the item are close to each other in the query and/or item; thesaurus expansion: expand search words by adding synonyms; thesaurus inclusion, add synonym cross-reference to indexing mechanism instead of adding them to the search string; sounds-like: base search on soundex or similar codes instead of words; soundex-enhanced thesaurus: add words or cross-references based on synonyms of soundex-expansions; syntactic connectedness: increase the score where the words fall on the same branch of a parse tree (using any of several parsing methods); semantic connectedness: replace the syntactic parse with semantic analysis, based, for instance, on CYC technology or simpler forms of transformational analysis.

If a match is made, then one of two actions are taken depending if the community field in the matched record is null.

The **first action** is to consider the case of a null community entry. The invention contacts the currently searching and the previously searching users and asks them if they want to join a new community on the topic of the search string in the following manner. Initially the current searching user is contacted by the invention automatically. If that person indicates their interest in joining a community then the **second action** of the invention is to locate non-searching user(s) in the matched field and contacted them and ask if they want to join this community. If each answers in the affirmative, the invention automatically forms a new community and the users are entered as members of that community.

The invention picks a name for the community that the users can

later change. The name of the community is inserted into the database in the records of the present user and the matched user(s). Both the currently searching and the formerly searching users must agree to be in the community and the nature of the community, e.g.,

5 whether the community will be open to others or a closed confidential community. Another embodiment of the invention matches a searching user with members of existing communities found outside the invention but existing on a telephone system, the Internet, an intranet, extranet or standalone computer.

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A community is defined as a list of two or more users that wish to communicate with each other based upon matching words of a search string. The matched search string or variation identifies the list. The list contains the telephone number or email addresses of the 15 users. Users are permitted to email the list using a list serve or to post messages or chat with the community members. Users can remain anonymous if they so desire.

In the case of a non-null community entry, after the match is 20 made only the present user is invited to join the already existing community. If the user answers in the affirmative, then the present user is added by the invention to the list for that extant community. The name of the community is added to the database for the present user. While the above text describes the primary 25 embodiment of the invention, additional variations are now described. When matches are attempted, the invention adds contextual information to the user's search string. Users can have input and output via telephone, email, a person, fax, surface mail, or web-based email.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention together with the above and other advantages may best be understood from the following detailed 5 description of the embodiments of the invention illustrated in the drawings, wherein:

FIG. 1 is a block diagram of the invention and its relationship to the Internet or an intranet or a telephone system, the computer, the 10 search engine, a listserve, a database server.

FIG. 2 is a block diagram of the E-COMMUNITY DATABASE showing various records, e.g., Record 1, Record 2, . . . , Record i

FIG. 3 is a block diagram of Record i [Required information] and indicating the User ID, Search string, Community

15 FIG. 4 is a block diagram of Record i [Optional information] with the date/time, context, scope measure, matching disable, anonymity, match age of request

FIG. 5 is a block diagram of the record 1 after a sample search by dan@buzzit.com for "Boston Red Sox" User ID: dan@buzzit.com, Search 20 string: "Boston Red Sox", Community: Null

FIG. 6 is a block diagram of the record 2 after search by carl@myisp.com for "Boston Red Sox"

User ID: carl@myisp.com, Search string: "Boston Red Sox", Community: Null

25 FIG. 7 is a block diagram of the Records 1+2 after dan@buzzit.com and carl@myisp.com agree to form a community: "Boston Red Sox" with Records 1 and 2: Record 1, User ID: dan@buzzit.com, Search string: "Boston Red Sox", Community: "Boston Red Sox"  
Record 2, User ID: carl@myisp.com, Search string: "Boston Red Sox", 30 Community: "Boston Red Sox"

FIG. 8 is a block diagram of the Listserver after dan@buzzit.com and carl@myisp.com agree to form community "Boston Red Sox", Community:

"Boston Red Sox", Members: User ID: dan@buzzit.com, User ID: carl@myisp.com

DETAILED DESCRIPTION OF THE INVENTION

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Summary of invention plus description

Electronic networks (e.g., the Internet) provide a number of services for its users. The primary services relevant to this patent application are communities or stand alone chat rooms, 10 bulletin boards, list serves, electronic mail (email) and databases.

One of the major driving forces in the growth of networks in general and the Internet in particular has been the way it facilitates people's ability to find others of similar interests.

15 Chat, bulletin boards, date matching services and list services are among the most popular activities on the net. People have a need to meet people and overcome the limitations of their physical separation.

20 However, one of the weaknesses of these existing systems is that they require users to either (1) enter a pre-defined gathering space or answer questions or (2) create a pre-determined profile. Such previous systems would by their nature limit the matches to the predetermined records and fields or a profile. If the participants 25 or designers of existing matching systems fail to anticipate a new topic, interest or future need matching cannot occur.

30 This patent covers the apparatus, means and methods for automatically matching based upon the search terms entered into a telecommunications system, the Internet (World Wide Web), standalone computer, intranet or extranet. Further, it provides a means and method of comparing that search with prior search terms entered by

others to make a match between similar searches - without needing to predetermine the basis for the match. After making a match the invention will invite the matched parties to join a frictionless and immediate electronic community if they so desire. These communities 5 may be as small as just two people and as large as tens or hundreds of thousands of participants.

Who is benefited from this invention? People who are having trouble utilizing their new product purchase and would like to talk, 10 chat, or email with someone who has bought the product earlier and figured out how to use it. Someone researching a rare disease and seeking a medical expert might use this invention with life saving results.

15 What else exists today that provides a portion of the functionality of the intention? ICQ, AOL and other Chat rooms, List serves, and UseNet groups are set up around a particular topic and these list serves are collected and administered or archived by Yahoo, ICQ, AOL, Topica and Google to name a few. The problem is 20 that there typically needs to be a critical mass of 5-500 users to provide enough people to cover the wide range of questions that might be ask on any given topic. This invention only requires that there be as little as two people who have a similar interest and even if the earlier searcher is not currently looking for 25 information on this subject this invention "remembers" his or her interest and offers to make a match.

Who kind of searches work best with the invention? The more specific the search the more targeted are the results. For instance 30 someone searching for "jaguar" might get matched to people interested in cars, a cat, a Florida football team, a type of computer. So users who search for and XKE Jaguar acceleration will

only get information about that car and not the jungle animal.

List servers are one of the components of this system. Email can be subdivided into one-to-one delivery and one-to-many. One-to-  
5 many is supported by list servers that maintain distribution lists. The distribution lists can be edited electronically by sending email directly to programs that maintain the lists. An example of the one-to-many email services is Usenet. Herein, we define the "many" in one-to-many as a community. Questions can be posed to community  
10 members so those users can solve problems. An object of a community is to provide users a way to ask for or share information with other users. Users who use a list serve or chat room often times cannot find communities to pose questions. Existing communities might be off-topic or too broad, or might not exist for a particular topic of  
15 interest.

The web is a database distributed across many computers. The various computers are connected electronically via hyperlinks in the data itself. A derivative service of the web is a means, described  
20 or referred to as "a search engine," that enables users to locate information in the distributed database. An object of search engines is to help users find information on the Web. Users often times have difficulty obtaining information because the search engines find too much or too little information. Users also have  
25 trouble finding other people of similar interests.

The object of this invention is for users to combine the services of search, email, phones, fax, and the web to form communities. The present invention is designed to operate in  
30 person using a standalone computer, or a computer that provides communication to users with an archival database, interface to a phone handset on a telecommunications or data network, a wireless

phone, automated agents and an electronic list server.

Users can communicate with the computer via direct network connections, serial lines (e.g., a modem connection), or directly via a keyboard/monitor combination. Users may be identified using various means including their email address, their login name, or other unique identifier; denoted their ID, or some combination of these. Other means of identifying users are possible and the present invention is not limited to those listed here

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The initial interaction of the user with the computer is to search for data. In the present embodiment of the invention, the data could be located on the computer itself, in distributed databases over a network connection (e.g., the Internet, intranet or extranet) or over a telephone system. The user performs a search utilizing natural language consisting of a series of keywords, phrases, or sentences, called a "search string." Other types of search strings or search input are possible. The computer has means to pass the search string or search input to a search engine, which could be located on the computer itself or remotely on the network.

The invention will take people matched by their search string or search input and offer them the opportunity to enter an existing community or create a new community consisting of a text or voice

chat room for real-time conversation via text or speech and a bulletin board. The community can also contain useful links to information, goods and services. Also the community will provide users with preferences to modify the look, feel and functionality of the community. For example users may not want a chat room and only want a bulletin board. Users may or may not want to shop from a community. Users may or may not want the community to suggest links to information, goods and services.

The computer also contains a storage mechanism (e.g., a disk) on which a database is maintained. In the present embodiment of the invention, there is database. This database provides a method of 5 keeping track of search entries and who made those searches. The database maintains a set of entries containing a user ID, an associated search string, and a name or names of relevant community(s).

10 A community is a gathering of two or more people, virtual people or intelligent agents. A community contains a text or voice chat room and a bulletin board and useful links.

15 When the user enters a new search string and the search string is entered into the database, the community field is set to an empty string, denoted null. The invention will attempt to make match between a current search by one person and previous searches by one or more other person(s). The invention will also attempt to locate (match) a current search string with existing communities on the 20 Internet, a telecommunications system or elsewhere. These existing communities might have been set up previously by the invention or exist elsewhere on a network. The invention stamps the time and date of the search. In a preferred embodiment of the invention, the database is routinely purged of entries older than a specified 25 duration.

30 Matching telephone or Internet users based on any search terms with anyone else in the world subscribing or otherwise able to access this invention creates frictionless worldwide voice-based or data-based communities assembled in real-time with no bureaucracy.

Users are not required to enter profile information about

themselves. Contextual information can be gathered from a larger universe of identifiers that indicate this person is a member of a consumer, chemical, electronics, job search, transportation, scientific, engineering, arts, social services, other industry  
5 verticals, or indicators of other broad categories about the type or nature of the user. For example, this information can be derived from their passage through a hierarchical search, a password, name of their originating site or the domain of the user.

10 A preferred embodiment of the invention should give users the ability to simply turn off the matching feature from their computer, browser or telephone. Also the invention can provide for levels of permission and levels of security. Likewise, an embodiment of the invention allows the users to specify the age of search matches.  
15 For example, a user might ask that no search match older than 6 months occur and another user might insist that no match older than 3 weeks be made.

20 After the user has entered his/her search string, the computer checks all other entries in the stored database to see if the present search string matches a previous search string in the database. This database incorporates one or more of the following methods: words in a database (with triggers or without), a hash table (faster but more memory intensive), a flat text file, an  
25 associative array (built on top of a hash table), or rules in a forward-chaining production system (fast but memory intensive). This same invention can be used on a telephone via sounds with associated meaning stored by a voice to text software program to the invention, such as Naturally Speaking or Via Voice. This enables  
30 the present invention for use on a data network and, or, telephone system to facilitate making matches over analog, digital or mixed phone and computer systems.

The mechanisms for implementing matching for a search string include the following methods: simple string match - does a word or series of words in the query match an item in the stored database  
5 within the system; a weighted string match - for each word in the query assign points to items in the system based on an inverse overall frequency score so that 'rare' words get higher scores than common words and return the items with the highest overall scores.

10 On these match methods the invention incorporates a number of methods as follows: closeness, increase the score where words matching in the item are close to each other in the query and/or item; thesaurus expansion: expand search words by adding synonyms; thesaurus inclusion, add synonym cross-reference to indexing  
15 mechanism instead of adding them to the search string; sounds-like: base search on soundex or similar codes instead of words; soundex-enhanced thesaurus: add words or cross-references based on synonyms of soundex-expansions; syntactic connectedness: increase the score where the words fall on the same branch of a parse tree (using any  
20 of several parsing methods); semantic connectedness: replace the syntactic parse with semantic analysis, based, for instance, on CYC technology or simpler forms of transformational analysis.

25 If a match is made, then one of two actions are taken depending if the community field in the matched record is null.

The **first action** is to consider the case of a null community entry. The invention contacts the currently searching and the previously searching users and asks them if they want to join a new  
30 community on the topic of the search string in the following manner. Initially the current searching user is contacted by the invention automatically. If that person indicates their interest in joining a

community then the **second action** of the invention is to locate non-searching user(s) in the matched field and contacted them and ask if they want to join this community. If each answers in the affirmative, the invention automatically forms a new community and

5 the users are entered as members of that community.

The invention picks a name for the community that the users can later change. The name of the community is inserted into the database in the records of the present user and the matched user(s).

10 Both the currently searching and the formerly searching users must agree to be in the community and the nature of the community, e.g., whether the community will be open to others or a closed confidential community. Another embodiment of the invention matches a searching user with members of existing communities found outside the invention but existing on a telephone system, the Internet, an intranet, extranet or standalone computer.

15 A community is defined as a list of two or more users that wish to communicate with each other based upon matching words of a search string. The matched search string or variation identifies the list. The list contains the telephone number or email addresses of the users. Users are permitted to email the list using a list serve or to post messages or chat with the community members. Users can remain anonymous if they so desire.

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In the case of a non-null community entry, after the match is made only the present user is invited to join the already existing community. If the user answers in the affirmative, then the present user is added by the invention to the list for that extant  
30 community. The name of the community is added to the database for the present user. While the above text describes the primary embodiment of the invention, additional variations are now

described. When matches are attempted, the invention adds contextual information to the user's search string. Users can have input and output via telephone, email, a person, fax, surface mail, or web-based email.